

SYMPTOM	PROBABLE CAUSE	SOLUTIONS
Joystick erratic or does not respond as desired.	Damaged motor coupling.	Contact Dealer/Invacare for Service.
	Electrical malfunction.	Contact Dealer/Invacare for Service.
	Controller programmed improperly.	Reprogram controller. (Refer to electronics manual supplied with wheelchair).
Wheelchair does not respond to commands.	Poor battery terminal connection.	Clean terminals (Refer to <u>Cleaning Battery Terminals</u> on page 102).
Power indicator OFF—even after recharging.	Electrical malfunction.	Contact Dealer/Invacare for Service.

## Wheelchairs with Powered Seating Systems

SYMPTOM	PROBABLE CAUSE	SOLUTIONS
Wheelchair Power ON but does not drive	System tilted, reclined or elevated beyond drive lock-out angle (20°).	Return to neutral position (upright and completely lowered). <b>Refer to <u>Operating Powered Seating Systems</u> on page 50.</b> Contact Invacare/Dealer for service if this does not solve the problem.
Seating system not functioning or working intermittently.	Low batteries.	Charge batteries.
	Faulty electrical connection.	Check all connections.
	Blown fuse.	Have wiring harness replaced by a qualified technician.
	Seat has been driven under a heavy load for an extended period of time.	Allow time for the electronics to cool down (Light Duty Use).
Programmer does not work or gives “communication error”	System tilted, reclined or elevated beyond drive lock-out angle (20°).	Return to neutral position (upright and completely lowered). <b>Refer to <u>Operating Powered Seating Systems</u> on page 50.</b> Contact Invacare/Dealer for service if this does not solve the problem.
Wheelchair drives at reduced speed.	Seating system is elevated.	Return joystick to neutral position and completely lower the seat.

## Checking Battery Charge Level

The following “Do’s” and “Don’ts” are provided for your convenience and safety.

DON'T	DO
Don't perform any installation or maintenance without first reading this manual.	Read and understand this manual and any service information that accompanies a battery and charger before operating the wheelchair.
Don't perform installation or maintenance of batteries in an area that could be damaged by battery spills.	Move the wheelchair to a work area before cleaning terminals, or opening battery box.
Don't make it a habit to discharge batteries to the lowest level.	Recharge as frequently as possible to maintain a high charge level and extend battery life.
Don't use randomly chosen batteries or chargers.	Follow recommendations in this manual when selecting a battery or charger.
Don't put new batteries into service before charging.	Fully charge a new battery before using.
Don't tip or tilt batteries.	Use a carrying strap to remove, move or install a battery.
Don't tap on clamps and terminals with tools.	Push battery clamps on the terminals. Spread clamps wider if necessary.
Don't mismatch your battery and chargers.	Use ONLY a GEL charger for a GEL battery.

# SECTION 5—WHEELCHAIR OPERATION

## ⚠ WARNING

After **ANY** adjustments, repair or service and **BEFORE** use, make sure that all attaching hardware is tightened securely - otherwise injury or damage may result.

Set-up of the Electronic Control Unit is to be performed only by a qualified technician. The final adjustments of the controller may affect other activities of the wheelchair. Damage to the equipment could occur under these circumstances.

## Operating the Wheelchair

*NOTE: For this procedure, refer to FIGURE 5.1.*

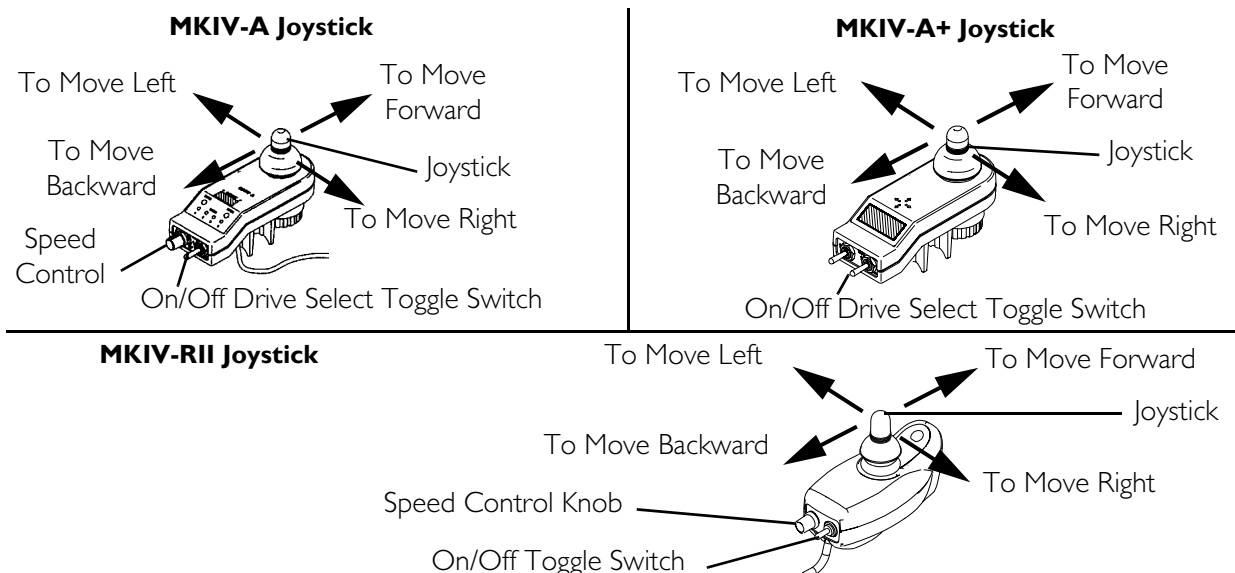
### Turning the Power On/Off

1. To turn the power on, move the on/off toggle switch up to the On position.

*NOTE: After turning power on, all indicators will light briefly and the display gauge will indicate one of the following:*

- *The Current Battery Charge - Information gauge shows all LED's lit or partial LED's lit. Refer to table on previous page.*
- *Out of Neutral at Power Up - Information Gauge shows all LED's flashing slowly. This occurs when the power is turned on when the joystick is out of neutral. This feature prevents sudden and unexpected movements of the power wheelchair.*

2. To turn the power OFF, move the on/off toggle switch down to the OFF position.



**FIGURE 5.1** Operating the Wheelchair

## Using the Joystick to Drive the Wheelchair

The joystick is located at the front of the joystick housing and provides smooth control of speed and direction. It is equipped with 360 degrees of mobility for ease of operation. The joystick is spring-loaded, and automatically returns to the upright (neutral) position when released. Pushing the joystick in a given direction causes the wheelchair to move in that direction.

The joystick has proportional drive control, meaning that the further it is pushed from the upright (neutral) position, the faster the wheelchair moves. The maximum speed, however, is limited by the setting of the speed-control knob.

To slow the wheelchair to a stop, simply release the joystick. The wheelchair has automatic speed and direction compensation to minimize corrections.

When first learning to drive, select a slow speed and try to drive the wheelchair as slowly as possible by pushing the joystick slightly forward. This exercise will help you learn to utilize the full potential of the proportional control and allow you to start and stop smoothly.

To drive the wheelchair, perform the following steps:

1. Perform one of the following:
  - MKIV-A and MKIV-RII Joysticks - Adjust speed control knob to the appropriate setting.
  - MKIV-A+ Joysticks - Select the desired drive program.
2. Turn the power on. Refer to Turning the Power On/Off on page 47.
3. Maneuver the joystick in the following manner:

MOVEMENT	ACTION
Forward	Push forward on the joystick.
Reverse	Pull back on the joystick.
Turn Left	Move the joystick right.
Turn Right	Move the joystick left.
Stop	Release the joystick and the wheelchair will quickly slow down.

*NOTE: For specific information about the joystick installed on the wheelchair, refer to one of these procedures:*

- MKIV-A Joystick Switches and Indicators on page 56.
- MKIV-A+ Joystick Switches and Indicators on page 59.
- MKIV-RII Joystick Switches and Indicators on page 61.

## A Note About Drive Lock-Out

---

### **WARNING**

**NEVER** operate the wheelchair or elevate/lower the seat while the back is in any tilted/reclined/back angle position over 20° relative to the vertical position. If the drive lock-out does not stop the wheelchair from operating or the seat from elevating/lowering in a tilt/recline/back angle position over 20° relative to the vertical position, **DO NOT** operate the wheelchair or elevate/lower the seat. **DO NOT** attempt to adjust the drive lock-out. Have the wheelchair serviced by a qualified technician.

The wheelchair user **MUST** have a clear line of sight to drive safely. On initial wheelchair delivery and after adjusting the back angle, drive lock-out switch, tilt system or recline system, tilt and recline the seat back to the farthest driving position immediately before drive lock-out engages and ensure there is a clear line of sight present in which to drive the wheelchair. If a clear line of sight is not present, have the back angle repositioned or readjust the lockout angle such that safe driving with a clear line of sight is achieved. Otherwise injury or damage may occur.

---

The LED on the single function toggle switch will light when the drive lock-out feature has been activated. Drive lock-out is a feature designed to prevent the wheelchair from being driven after the seating system has been tilted or reclined beyond 20°\* relative to the vertical position. The back can be positioned at a 10° relative offset to the seat base, thereby resulting in a back angle potential of 30° before which the drive lock-out is activated. This may affect the wheelchair user's line of sight while driving. Make sure the wheelchair user can see properly to ensure safe driving.

*\*NOTE: 20° back angle can be any combination of recline, tilt, back angle and/or surface angle.*

*NOTE: Refer to Typical Product Parameters for 2G Tarsys on page 21 or Elevating Seat/Power Tilt Only on page 22 for tilt and/or recline angle ranges.*

## Operating Powered Seating Systems

---

### **GENERAL WARNINGS**

Refer to **A Note About Drive Lock-Out** on page 49 **BEFORE** performing this procedure.

Pinch points may occur when returning the seat from any tilted position to the full upright position or when lowering the elevating seat. Make sure the hands and body of both the occupant and attendants/bystanders are clear of all pinch points before returning the seat to the full upright position or lowering the elevating seat.

**NEVER** operate the wheelchair or elevate/lower the seat while the back is in any tilted/reclined/back angle position over 20° relative to the vertical position. If the drive lock-out does not stop the wheelchair from operating or the seat from elevating/lowering in a tilt/recline/back angle position over 20° relative to the vertical position, **DO NOT** operate the wheelchair or elevate/lower the seat. **DO NOT** attempt to adjust the drive lock-out. Have the wheelchair serviced by a qualified technician.

**DO NOT** operate the seating system while on an incline.

**DO NOT** operate seating system while the wheelchair is moving.

**DO NOT** operate the tilt or elevate function near or under a fixed object such as a table or desk.

---

### **ELEVATING SEAT WARNING**

The elevating seat option is equipped with a speed reduction safety mechanism. While the seat is in an elevated position, the safety feature slows the speed of the wheelchair to 20% of its maximum speed (not to exceed the programmed speed). If the wheelchair operates at maximum speed while in an elevated position, **DO NOT** operate the wheelchair. Have the wheelchair serviced immediately by a qualified technician.

---

### **2G TARSYS CAUTION**

**DO NOT** operate the recline function of the seating system if one or both of the mechanical elevating legrest push rods is bent. Damage to the seating system can occur.

---

## ⚠ **ACTUATOR CONTROL WARNING**

Use only the actuator controls listed in the following chart to activate the tilt/recline/elevate functions. **DO NOT USE** any other actuator controls. Such devices may result in excess heating and cause damage to the actuator and associated wiring and could cause a fire, death, physical injury or property damage. If such devices are used, Invacare shall not be liable and the limited warranty is void.

SEATING SYSTEM	ACTUATOR CONTROL				
	TRSS	TRCM	TAC	SAC	ESC
<b>2G TARSYS - TILT ONLY</b>	Y	Y	Y	N	N
<b>2G TARSYS - TILT ONLY WITH POWER LEGS</b>	N	Y	N	N	N
<b>2G TARSYS - RECLINE ONLY</b>	N	Y	Y	N	N
<b>2G TARSYS - RECLINE ONLY WITH POWER LEGS</b>	N	Y	N	N	N
<b>2G TARSYS - TILT/RECLINE</b>	N	Y	N	N	N
<b>POWER TILT ONLY</b>	Y	Y	Y	N	N
<b>ELEVATING SEAT ONLY</b>	N	N	Y	N	Y
<b>POWER TILT/ELEVATING SEAT</b>	N	N	Y	N	N

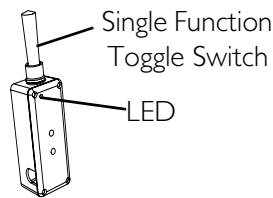
*NOTE: This procedure applies to wheelchairs with 2G Tarsys, Elevating Seat and/or Power Tilt seating systems ONLY.*

## Single Function Toggle Switch

*NOTE: For this procedure, refer to FIGURE 5.2 on page 52.*

1. Make sure the wheelchair is on a level surface.
2. Refer to the chart for the operation of the seating system using a single function toggle switch mounted on the right side of the wheelchair.
3. Release single function toggle switch to neutral position.

SEATING SYSTEM	SINGLE FUNCTION TOGGLE SWITCH	
	FORWARD	BACK
<b>2G TARSYS - TILT ONLY</b>	Decrease Tilt Angle	Increase Tilt Angle
<b>ELEVATING SEAT ONLY**</b>	Raise the Seat	Lower the Seat
<b>POWER TILT ONLY</b>	Decrease Tilt Angle	Increase Tilt Angle
**NOTE: The seat MUST be tilted/reclined so the back angle is less than 20° relative to the vertical position before elevating/lowering the seat.		



**FIGURE 5.2** Single Function Toggle Switch

### Optional Four-Way Toggle Switch

*NOTE: For this procedure, refer to FIGURE 5.3 on page 54.*

*NOTE: This procedure applies to wheelchairs with Elevating Seat, Power Tilt and 2G Tarsys systems only.*

1. Make sure the wheelchair is on a level surface.
2. Refer to the charts for the operation of the seating system using a four-way toggle switch:

*NOTE: The charts show the factory programmed settings only. Switch assignments can be reprogrammed.*

#### Seating Systems with the TAC Actuator Control

SEATING SYSTEM	FOUR-WAY TOGGLE SWITCH			
	FORWARD	REAR	LEFT	RIGHT
2G Tarsys - Tilt Only	Increase Tilt Angle	Decrease the Tilt Angle	N/A	N/A
2G Tarsys - Recline Only	Increase the Recline Angle/ Back Height (VSR) Up	Decrease the Recline Angle/ Back Height (VSR) Down	N/A	N/A
Elevate Only**	Raise the Seat	Lower the Seat	N/A	N/A
Power Tilt Only	Increase Tilt Angle	Decrease the Tilt Angle	N/A	N/A
Tilt/Elevate**	Increase/ Decrease the Tilt Angle*	Raise/Lower the Seat*	N/A	N/A

*NOTE: If the wheelchair is equipped with switch options, scan to the correct ECU or Auxiliary Mode and activate the control device in the corresponding "forward" direction to operate the tilt function. Refer to the Electronics Service Manuals listed in Reference Documents on page 2 for complete switch option operating instructions.*

*\*NOTE: The four-way toggle switch will alternate functions (increase tilt angle, decrease tilt angle) after it has been released to the neutral position for a minimum of five seconds. Refer to the Electronics Service Manual listed in Reference Documents on page 2 for complete four-way toggle switch operating instructions.*

*\*\*NOTE: The seat MUST be tilted/reclined so the back angle is less than 20° relative to the vertical position before elevating/lowering the seat.*



**Seating Systems with the TAC Actuator Control**

SEATING SYSTEM	FOUR-WAY TOGGLE SWITCH			
	FORWARD	REAR	LEFT	RIGHT
Power Legrests Only	Raise/Lower Power Legrests*	N/A	N/A	N/A

*NOTE: If the wheelchair is equipped with switch options, scan to the correct ECU or Auxiliary Mode and activate the control device in the corresponding "forward" direction to operate the tilt function. Refer to the Electronics Service Manuals listed in Reference Documents on page 2 for complete switch option operating instructions.*

*\*NOTE: The four-way toggle switch will alternate functions (increase tilt angle, decrease tilt angle) after it has been released to the neutral position for a minimum of five seconds. Refer to the Electronics Service Manual listed in Reference Documents on page 2 for complete four-way toggle switch operating instructions.*

*\*\*NOTE: The seat MUST be tilted/reclined so the back angle is less than 20° relative to the vertical position before elevating/lowering the seat.*

**Seating Systems with the TRCM Actuator Control**

SEATING SYSTEM	FOUR-WAY TOGGLE SWITCH			
	FORWARD	REAR	LEFT	RIGHT
2G Tarsys - Tilt Only	Increase/ Decrease the Tilt Angle*	N/A	N/A	Raise/Lower Power Legrests*
2G Tarsys - Recline Only	N/A	Increase/ Decrease the Recline Angle*	Increase/Decrease the Back Height (VSR)*	Raise/Lower Power Legrests*
2G Tarsys - Tilt/Recline	Increase/ Decrease the Tilt Angle*	Increase/ Decrease the Recline Angle*	Increase/Decrease the Back Height (VSR)*	Raise/Lower Power Legrests*
Elevate Only**	N/A	Elevate/Lower the Seat*	N/A	Raise/Lower Power Legrests*
Power Tilt Only	Increase/ Decrease the Tilt Angle*	N/A	N/A	Raise/Lower Power Legrests*

*NOTE: If the wheelchair is equipped with switch options, scan to the correct ECU or Auxiliary Mode and activate the control device in the corresponding "forward" direction to operate the tilt function. Refer to the Electronics Service Manuals listed in Reference Documents on page 2 for complete switch option operating instructions.*

*\*NOTE: The four-way toggle switch will alternate functions (increase tilt angle, decrease tilt angle) after it has been released to the neutral position for a minimum of five seconds. Refer to the Electronics Service Manual listed in Reference Documents on page 2 for complete four-way toggle switch operating instructions.*

*\*\*NOTE: The seat MUST be tilted/reclined so the back angle is less than 20° relative to the vertical position before elevating/lowering the seat.*

### Seating Systems with the TRCM Actuator Control

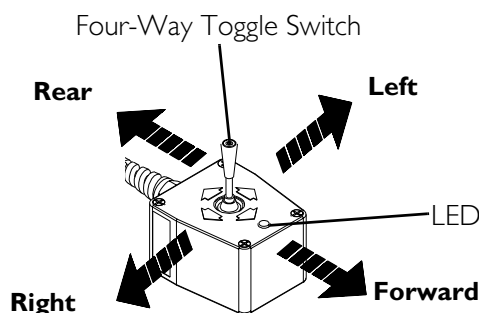
SEATING SYSTEM	FOUR-WAY TOGGLE SWITCH			
	FORWARD	REAR	LEFT	RIGHT
Tilt/Elevate**	Increase/ Decrease the Tilt Angle*	Elevate/Lower the Seat*	N/A	Raise/Lower Power Legrests*

NOTE: If the wheelchair is equipped with switch options, scan to the correct ECU or Auxiliary Mode and activate the control device in the corresponding "forward" direction to operate the tilt function. Refer to the Electronics Service Manuals listed in Reference Documents on page 2 for complete switch option operating instructions.

\*NOTE: The four-way toggle switch will alternate functions (increase tilt angle, decrease tilt angle) after it has been released to the neutral position for a minimum of five seconds. Refer to the Electronics Service Manual listed in Reference Documents on page 2 for complete four-way toggle switch operating instructions.

\*\*NOTE: The seat MUST be tilted/reclined so the back angle is less than 20° relative to the vertical position before elevating/lowering the seat.

3. Release four-way toggle switch to neutral position.



**FIGURE 5.3** Optional Four-Way Toggle Switch

### Vernier Shear Reduction (2G Tarsys Systems Only)

NOTE: For this procedure, refer to FIGURE 5.3 on page 54.

#### About Vernier Shear Reduction

### **⚠ WARNING**

The relationship between Vernier Shear Reduction (VSR) and the recline function of the seating system is dependent on the needs of the user and **MUST** be set and adjusted by a trained qualified technician.

Have the relationship between Vernier Shear Reduction (VSR) and the recline function of the seating system periodically inspected to maintain proper setting for the user. Otherwise injury to the user may result.

Vernier Shear Reduction (VSR) moves the back of the seating system along with the recline function. VSR reduces shear between the user and the seating system as the seating system reclines.

*NOTE: VSR is electronically linked to the recline function of the seating system and operating the recline function automatically activates VSR.*

VSR function can also be used independently from the recline function to allow for a change in seating position or access to additional seating system options. Refer to Using Vernier Shear Reduction (VSR) Independently of Recline Function on page 55.

### Using Vernier Shear Reduction (VSR) Independently of Recline Function

---

#### **⚠ WARNING**

**The back of the seating system *MUST* be returned to original position before the degree of recline is changed (increased or decreased). Otherwise, the relationship between VSR and the recline function of the seating system will change, possibly resulting in injury to the user.**

---

1. Make sure the wheelchair is on a level surface.
2. Note the current position of the back.
3. Push four-way toggle switch toward the left of the wheelchair until the desired VSR is achieved.

*NOTE: Left and right are determined by standing behind the wheelchair.*

*NOTE: The four-way toggle switch will alternate functions (move VSR actuator up, move VSR actuator down) after it has been released to the neutral position for a minimum of one second.*

*NOTE: If the wheelchair is equipped with switch options, scan to the correct ECU or Auxiliary Mode and activate the control device in the corresponding "left" direction to operate the tilt function. Refer to the Electronics Service Manual listed in Reference Documents on page 2 for complete switch option operating instructions.*

4. Return the back to the position noted in STEP 2 before changing the degree of recline.

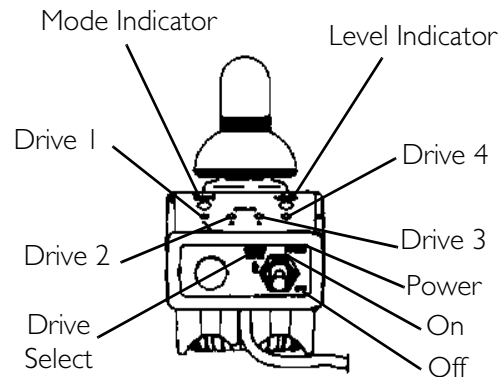
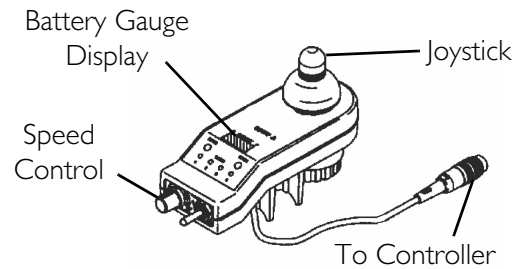
## MKIV-A Joystick Switches and Indicators

*NOTE: For this procedure, refer to FIGURE 5.4 on page 56.*

### Drive Select/On/Off Switch

A three position toggle switch is located at the back of the joystick housing. The Drive Select position is momentary.

This switch allows the operator to select the type of operation or performance which best suits a particular control need or situation. The Drive 1 program uses performance values which are independent of those used for the Drive 2 or 3 or 4 program. As an example, an operator may have a control need for spasticity in the morning and a very different need in the afternoon. Drive 1 can be programmed for higher speeds and quicker response while Drive 2 can be programmed for slower speeds and less responsiveness or vice versa. The other two drive programs could be indoor and outdoor versions of Drive 1 and Drive 2.



**FIGURE 5.4** MKIV-A Joystick Switches and Indicators

### Selecting the Drive Mode

1. To select Drive 1 mode, move the toggle Up and release. Drive 1 indicator becomes lighted.
2. To select Drive 2 mode, move the toggle Up and release again. Drive 2 indicator becomes lighted.
3. To select Drive 3 mode, move the toggle Up and release again. Drive 3 indicator becomes lighted.
4. To select Drive 4 mode, move the toggle Up and release again. Drive 4 indicator becomes lighted.
5. Move the toggle Up and release one more time to select Drive 1.

### Speed Control

Rotary knob is located at the back of the joystick housing. Turning the knob clockwise increases the maximum speed of the wheelchair.

## Joystick

Proportional drive control located at the front of the control provides smooth control of speed and direction.

## Battery Gauge Display (BGD)

Located at the rear of the control provides information on the remaining charge in the batteries. At full charge, the two left segments and the farthest right segment of the bar graph are lit. As the battery becomes discharged, the farthest right segment will progressively move to the left until only the last two bars are lit; at this level the last two bars will start to flash on and off to indicate the user should charge the batteries as soon as possible.

The BGD also serves as a system diagnostic device when a fault is detected by the control module. A specific number of bars (up to eight bars) will start to flash on and off to indicate the type of fault detected. A chart of the diagnostic indications is given in the Diagnostic Code Section of the electronics manual, part number 1043576.

## Mode and Level Indicators

Two LED indicators are located on either side of the battery bar graph display.

The Mode light is On (operational) with no options attached and level indicators are only operational when the optional ECU/Recliner Control or optional joysticks are utilized or the Reset switch is activated. These indicators provide information of the status of the control system and the environmental controls. The GREEN Mode indicator shows one of five control states.

<u>MODE (GREEN LED)</u>	<u>INDICATION</u>
Drive	Continuously on
Attendant	Flashing (twice/second)
E.C.U. or Recliner Control	Off
Stand-by	Flashing rapidly (four/second)
Remote Drive Selection	Slow Flashing (once/second)

The RED Level indicator provides information on the control level within each mode. Its operation changes with each mode:

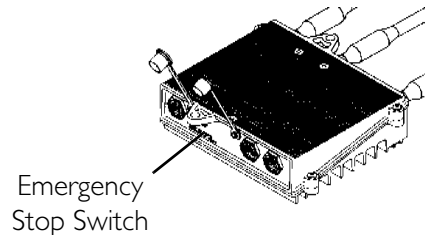
MODE	LEVEL INDICATOR	MEANING
Latched	Off	N/A
Proportional	Off	N/A
Attendant	Off	N/A
Momentary	Off	Slowest speed has been selected.
	Flashing	Medium speed has been selected.
	Rapid Flashing	Fastest speed has been selected.
ECU	Off	ECU 1 and/or ECU 3 are active.
	On	ECU 2 and/or ECU 4 are active.
	Flashing	Recliner control

MODE	LEVEL INDICATOR	MEANING
RIM	Off	Wheelchair moves forward when forward command is given.
	On	Wheelchair moves in reverse when forward command is given.

## Emergency Stop Reset Switch

*NOTE: For this procedure, refer to FIGURE 5.5.*

The emergency stop switch is used to stop the wheelchair and to select the operating mode for the wheelchair. The switch reset input connector is located on the control module next to the joystick input connector. An emergency stop switch is needed whenever any of the following operating modes are programmed.



**FIGURE 5.5** Emergency Stop Reset Switch

Environmental Controls (E.C.U.) including:

- Recliner Controls
- 3 Speed Mode in Momentary
- Latched Modes
- Pneumatic Control
- Stand-by Mode
- RIM Control
- Remote Drive Selection Mode

If any of the above modes are selected, the control will require activation of the switch immediately after the power switch is turned on in order to enter the drive mode. The GREEN mode indicator will be flashing rapidly. A second after the switch is released, the GREEN LED will light continuously to indicate the drive mode is active.

## Emergency Stop Reset Input Connector

The input connector accepts a 1/8-inch diameter Phono plug. The Emergency Stop switch must be an open contact for normal driving and a closed contact to activate the Emergency Stop function.

PIN	DESIGNATION
TIP	RESET (EMERGENCY STOP)
RING	COMMON (B-)

## MKIV-A+ Joystick Switches and Indicators

*NOTE: For this procedure, refer to FIGURE 5.6 and FIGURE 5.7 on page 60.*

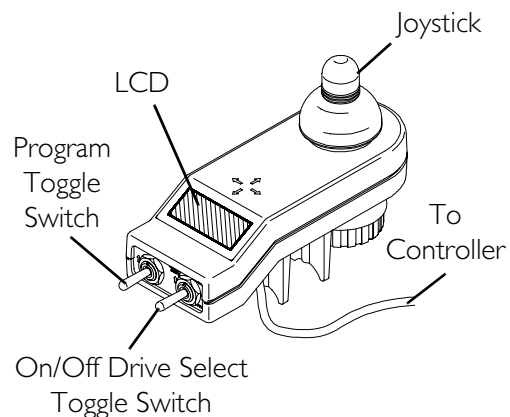
### Drive Select/On/Off Switch

A three position toggle switch is located at the back of the joystick housing. The Drive Select position is momentary.

This switch allows the operator to select the type of operation or performance which best suits a particular control need or situation. The Drive 1 program uses performance values which are independent of those used for the Drive 2 or 3 or 4 program. As an example, an operator may have a control need for spasticity in the morning and a very different need in the afternoon. Drive 1 can be programmed for higher speeds and quicker response while Drive 2 can be programmed for slower speeds and less responsiveness or vice versa. The other two drive programs could be indoor and outdoor versions of DRIVE 1 and Drive 2.

### Selecting the Drive Mode

1. Move the toggle Up and release. Drive 1 will appear on the LCD.
2. Move the toggle Up and release again. Drive 2 will appear on the LCD.
3. Move the toggle Up and release again. Drive 3 will appear on the LCD.
4. Move the toggle Up and release again. Drive 4 will appear on the LCD.
5. Move the toggle Up and release one more time to select Drive 1.



**FIGURE 5.6** MKIV-A+ Joystick Switches and Indicators - Drive Select/On/Off Switch

### Program Toggle Switch

The program toggle switch is located on the left side at the rear of the joystick housing. This switch is used to program the wheelchair. Refer to the electronics manual, part number 1043576, for more information about programming the wheelchair.

### Joystick

Proportional drive control knob located at the front of the joystick housing provides smooth control of speed and direction.



## LCD Display

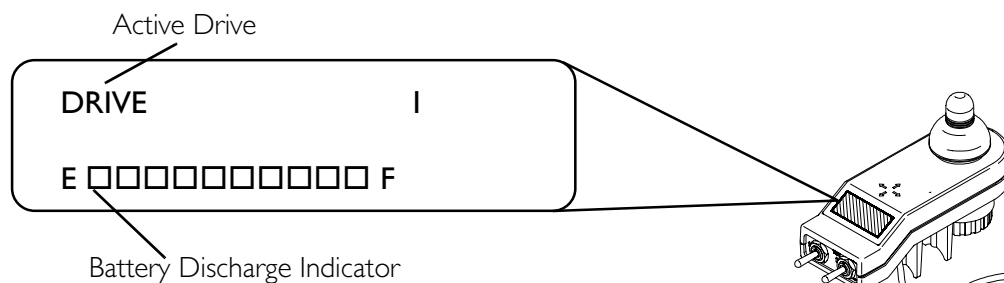
Located in front of the joystick, it provides information on the status of the wheelchair through a two line by twelve character length back lighted display. The LCD display is easily readable in both bright sunlight and complete darkness.

During normal operation the active drive is displayed on the left half of the first line. The left half of the second line is the Battery Discharge Indicator (BDI). It provides information on the remaining charge in the batteries. At full charge, solid blocks fill in all ten segments between E (Empty) and F (Full). As the battery becomes discharged, the farthest right segments will progressively disappear a half bar at a time until no segments appear between E and F. At this level the word RECHARGE will appear on the second line to indicate that the user should charge the batteries as soon as possible.

The right half of the display is the Information Center. The Information Center displays current data on the wheelchair. FIGURE 5.7 shows the factory default display.

Speedometer	Current Wheelchair Speed - MPH/KMH
Trip Odometer	Distance traveled since the wheelchair was last powered ON - MI/KM
Odometer	Total Distance Traveled (Factory Default) - MI/KM
Trip Amp-Hour Meter	Battery Capacity consumed since the wheelchair was last powered ON - AH
Battery Volts	Current Battery Voltage - VOLT
Battery Current	Battery Current being used - AMP
Load Test Results	Current battery condition based on a load test - BATT

If a fault is detected, the cause of the fault will scroll across the second line of the display.



**FIGURE 5.7** MKIV-A+ Joystick Switches and Indicators - Emergency Stop Reset Input Connector

## Emergency Stop Reset Switch

The emergency stop switch is used to stop the wheelchair and to select the operating mode for the wheelchair. The switch input connector is located on the control module next to the joystick input connector. An emergency stop switch is needed whenever any of the following operating modes are programmed:

- Environmental Controls (E.C.U.) including actuator controls
- 3 Speed Mode in Momentary
- Latched Modes



- Pneumatic Control
- Stand-by Mode
- RIM Control
- Remote Drive Selection Mode
- Information Center Display Selection (does not require Reset activation at power up)

If any of the above modes are selected, the control will require activation of the switch immediately after the power switch is turned on in order to enter the drive mode. The second line of the LCD will display - press Reset.

### Emergency Stop Reset Input Connector

The input connector accepts a 1/8-inch diameter Phono plug. The Emergency Stop switch must be an open contact for normal driving and a closed contact to activate the Emergency Stop function.

PIN	DESIGNATION
TIP	RESET (EMERGENCY STOP)
RING	COMMON (B-)

## MKIV-RII Joystick Switches and Indicators

*NOTE: For this procedure, refer to FIGURE 5.8 on page 62.*

### On/Off Switch

Two position toggle is located at the back of the joystick housing.

### Speed Control

Rotary knob is located at the back of the joystick housing. Turning the knob clockwise increases the maximum speed of the wheelchair.

### Joystick

Proportional drive control located at the front of the joystick housing provides smooth control of speed and direction.

### Battery Discharge Indicator (BDI)

Located at the front of the joystick housing provides information on the remaining charge in the batteries. At full charge, the BDI will be GREEN. As the battery becomes discharged, the BDI will become YELLOW (Amber), then RED and finally the BDI will flash On and Off Red. At this level, the user should charge the batteries as soon as possible.

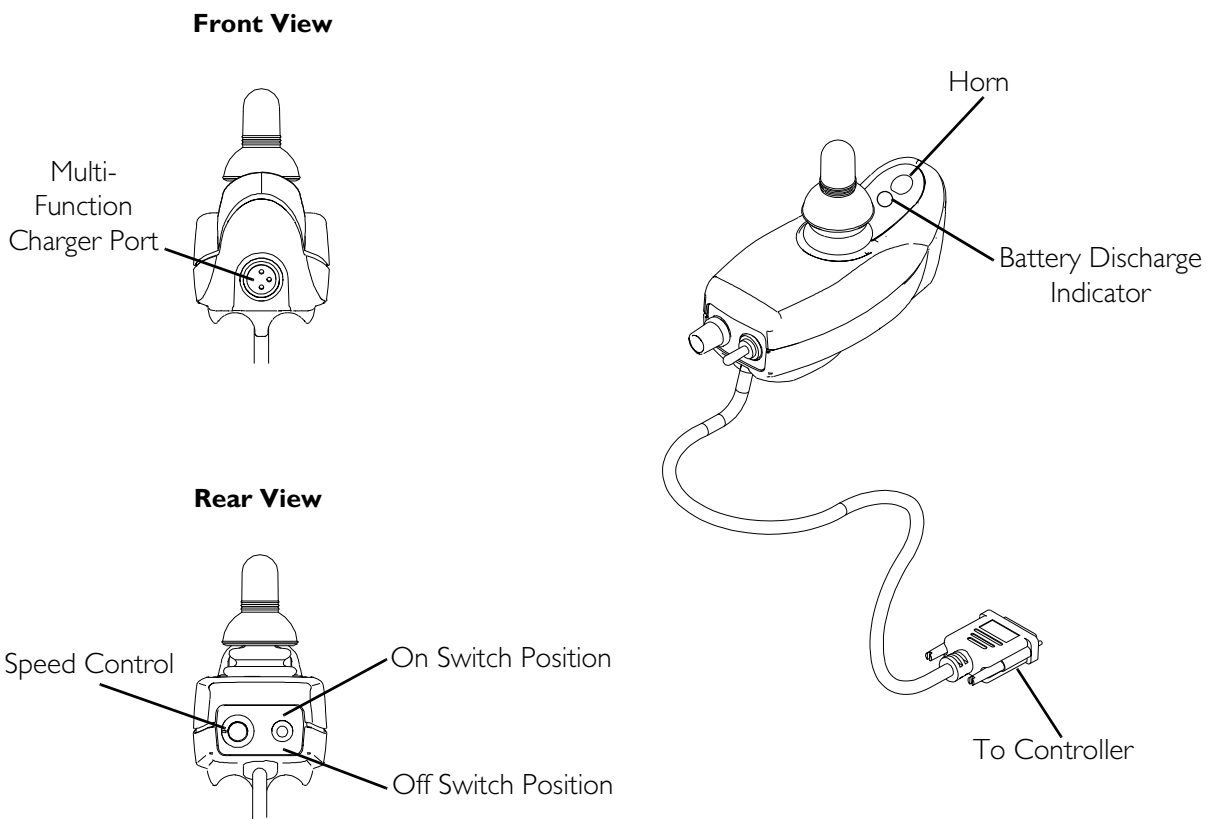
The BDI will flash On and Off YELLOW to indicate a reduced speed or power output.

The BDI also serves as a system diagnostic device when a fault is detected by the control module. A specific number of Green flashes will indicate the type of fault detected. A chart of the diagnostic indications is given in the Diagnostic Code Section of the Electronics manual, part number 1095272.

*NOTE: When reading the Battery Discharge Indicator (BDI), the joystick MUST be in the Neutral position for an accurate reading.*

## Multi Function Charger Port

Located at the front of the joystick housing provides easy access for charging the wheelchair batteries. This port also serves as the Remote Programmer/AVS Communication connection.



**FIGURE 5.8** MKIV-RII Joystick Switches and Indicators

## SECTION 6—FRONT RIGGINGS

### **⚠ WARNING**

After **ANY** adjustments, repair or service and **BEFORE** use, make sure that all attaching hardware is tightened securely - otherwise injury or damage may result.

While the wheelchair is moving, minimum ground clearance for the front rigging is three inches. If the wheelchair is not moving, the front rigging **MUST** maintain a minimum of one inch ground clearance - otherwise personal injury and damage may result.

For the following procedures, make sure the **ON/OFF** switch on the joystick is in the **OFF** position.

### Installing/Removing Footrests

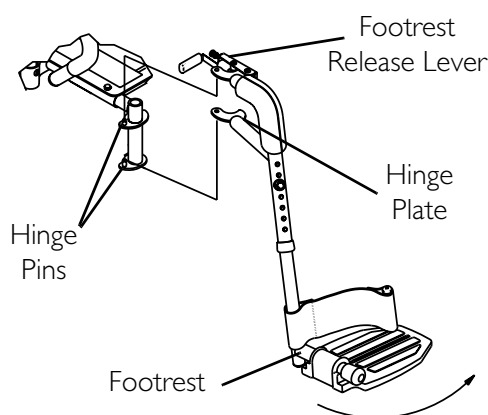
#### 70°/Taper Pin Style

*NOTE: For this procedure, refer to FIGURE 6.1.*

1. Turn the footrest to the side (open footplate is perpendicular to wheelchair).
2. Install the hinge plates on the footrest onto the hinge pins on the wheelchair frame.
3. Push the footrest towards the inside of the wheelchair until it locks into place.

*NOTE: The footplate will be on the inside of the wheelchair when locked in place.*

4. Repeat STEPS 1-3 for other footrest assembly.



**FIGURE 6.1** Installing/Removing Footrests - 70°/Taper Pin Style

5. To remove the footrest, push the footrest release lever inward, rotate footrest outward.
6. Adjust footrest height if desired. Refer to Footrest Height Adjustment on page 64.

#### 60°, 70°, MFX, Taper and 90°

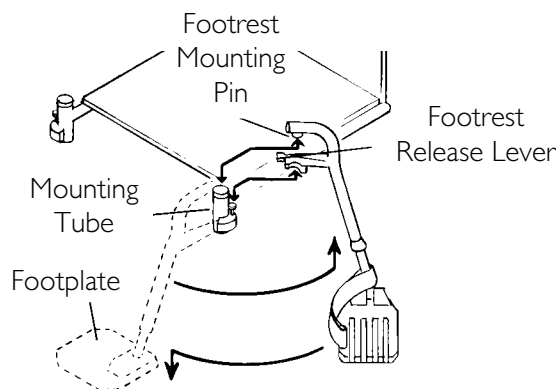
*NOTE: For this procedure, refer to FIGURE 6.2 on page 64.*

1. Turn the footrest to the side (open footplate is perpendicular to wheelchair itself).
2. Insert footrest mounting pin into mounting tube.
3. Push the footrest towards the inside of the wheelchair until it locks into place.

*NOTE: The footplate will be on the inside of the wheelchair when locked in place.*

4. Repeat STEPS 1- 3 for the other footrest assembly.

5. To remove the footrest, push the footrest release lever inward, rotate footrest outward.
6. Adjust footrest height if desired. Refer to Footrest Height Adjustment on page 64.



**FIGURE 6.2** 60°, 70°, MFX, Taper and 90°

## Footrest Height Adjustment

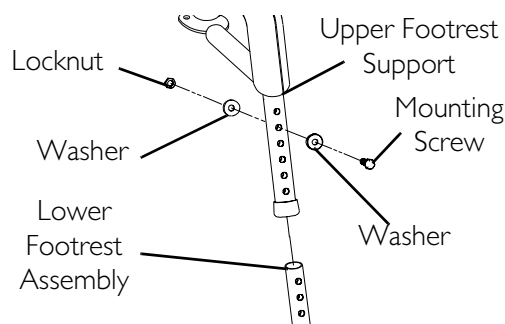
### 60°, 70°, 70° MFX, 90°, PW93, PW93E, PW93ST

*NOTE: For this procedure, refer to FIGURE 6.3.*

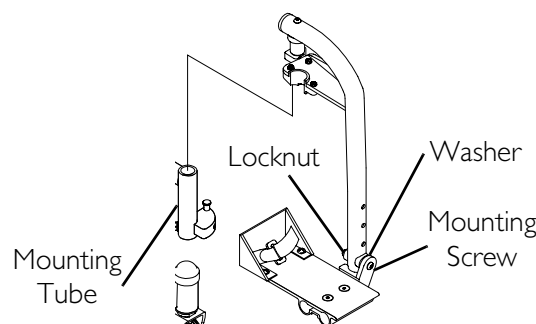
1. Remove any accessories from the footrest(s).
2. Remove the footrest from the wheelchair. Refer to Installing/Removing Footrests on page 63.

*NOTE: Lay the footrest on a flat surface to simplify this section.*

3. Remove the mounting screw, washers and locknut that secure the lower footrest to the footrest support.
4. Reposition the lower footrest to the desired height.
5. Reinstall the mounting, washers and locknut that secure the lower footrest to the footrest support and tighten securely.
6. Repeat STEPS 1-5 for the opposite side of the wheelchair footrest, if necessary.
7. Reinstall the footrest(s) onto the wheelchair. Refer to Installing/Removing Footrests on page 63.
8. Reinstall any accessories onto the footrest(s).



**90° Footrest**



**FIGURE 6.3** Footrest Height Adjustment -  
60°, 70°, 70° MFX, 90°, PW93, PW93E,  
PW93ST

### 60° MFX, 70° Taper

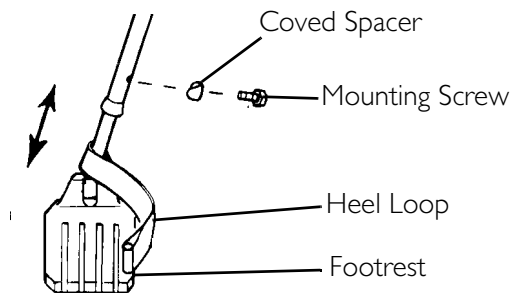
*NOTE: For this procedure, refer to FIGURE 6.4.*

1. Remove any accessories from the footrest(s).
2. Remove the footrest from the wheelchair. Refer to Footrest Height Adjustment on page 64.

*NOTE: Lay the assembly on a flat surface to simplify this section.*

*NOTE: Note the position of the spacers before disassembly.*

3. Remove the mounting screw and coved spacer that secures the lower footrest assembly.
4. Position the footrest assembly to the desired height.
5. Secure lower footrest assembly with existing mounting screw and coved spacer. Securely tighten.



**FIGURE 6.4** Footrest Height Adjustment -  
60° MFX, 70° Taper

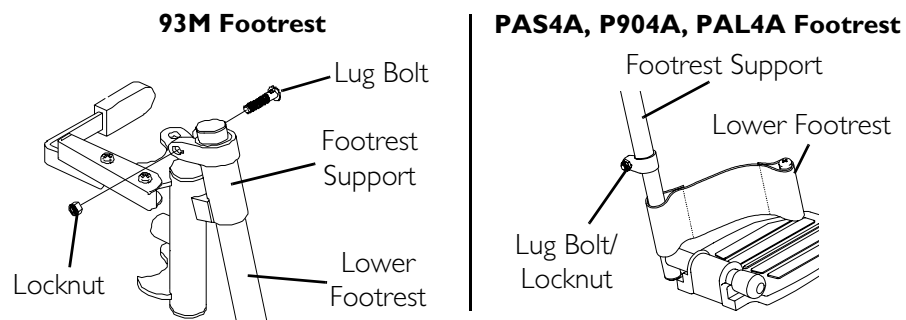
*NOTE: Make sure spacers are positioned properly when reassembling so as not to damage the frame mounting tubes.*

6. Reinstall the footrest(s) onto the wheelchair. Refer to Installing/Removing Footrests on page 63.
7. Reinstall any accessory onto the footrest(s).

### PAS4A, 93M, P904A, and PAL4A

*NOTE: For this procedure, refer to FIGURE 6.5.*

1. Loosen, but DO NOT remove the lug bolt and locknut that secure the lower footrest to the footrest support.
2. Reposition the lower footrest to the desired height.
3. Securely tighten the lug bolt and locknut that secure the lower footrest to the footrest support.
4. Repeat STEPS 1-3 for the opposite side of the wheelchair footrest, if necessary.



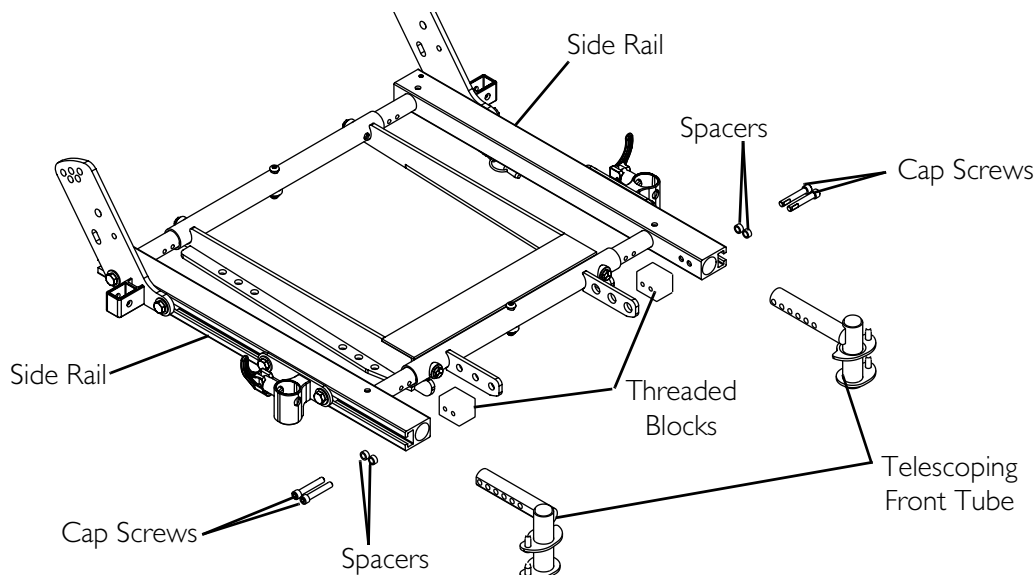
**FIGURE 6.5** Footrest Height Adjustment - PAS4A, 93M, P904A, and PAL4A

## Adjusting/Replacing Telescoping Front Rigging Support

### Wheelchairs without 2G Tarsys Systems

*NOTE: For this procedure, refer to FIGURE 6.6.*

1. Remove the two cap screws, spacers and threaded blocks securing the telescoping front tube to the side rail.
2. Perform one of the following:
  - Slide existing telescoping front rigging support to one of six depth positions.
  - Remove existing telescoping front rigging.
3. Secure the telescoping front tube to the side rail at the desired depth with the existing two cap screws, spacers and threaded blocks.
4. Repeat STEPS 1 to 3 on the opposite side, if desired.

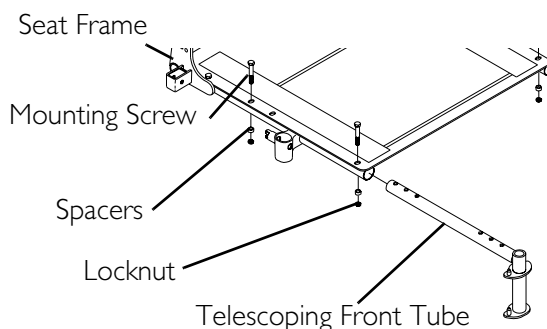


**FIGURE 6.6** Adjusting/Replacing Telescoping Front Rigging Support - Wheelchairs without 2G Tarsys Systems

## Wheelchairs with 2G Tarsys Seating Systems

*NOTE: For this procedure, refer to FIGURE 6.7.*

1. Remove the two mounting screws, spacers and locknuts that secure the telescoping front rigging support to the seat frame.
2. Perform one of the following:
  - Slide existing telescoping front rigging support to one of three depth positions.
  - Remove existing telescoping front rigging.
3. Secure telescoping front rigging at desired depth with existing two mounting screws, spacers, and locknuts. Securely tighten.



**FIGURE 6.7** Adjusting/Replacing Telescoping Front Rigging Support

*NOTE: The two telescoping front rigging supports can be positioned at different depths depending on the need of the user.*

## Installing Adjustable Angle Flip-up Footplate Hinge

*NOTE: For this procedure, refer to FIGURE 6.8.*

1. Position footplate hinge on the footrest support tube at the desired height.
2. Position mounting screw, washers, spacer, and locknut on the footrest support as shown in FIGURE 6.8.
3. Flip the footplate hinge to the Up position.

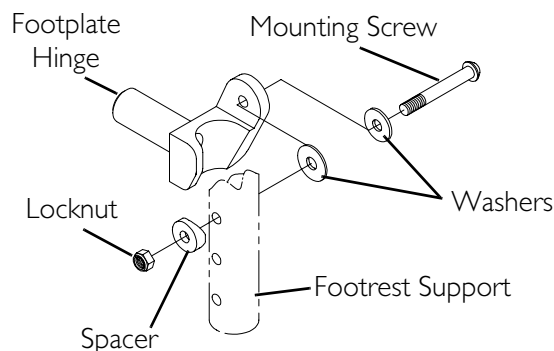
*NOTE: The footplate hinge will fall to the Down position.*

4. Tighten the mounting screw, washer, and locknut that secure the footplate hinge to the footrest support until the footplate hinge remains in the Up position.
5. Check the up and down motion of the footplate hinge to make sure the user of the wheelchair can operate the footplates easily.

*NOTE: If footplate's motion is too tight, loosen the mounting screw and locknut approximately 1/4-turn counter clockwise.*

*NOTE: If the footplate's motion is too loose, tighten mounting screw and locknut approximately 1/4-turn clockwise.*

6. Adjust footplate. Refer to Installing Adjustable Angle Flip-up Footplate Hinge on page 68.



**FIGURE 6.8** Installing Adjustable Angle Flip-up Footplate Hinge



## Installing/Adjusting Adjustable Angle Flip-Up Footplates

### Installing Adjustable Angle Flip-up Footplates

*NOTE: For this procedure, refer to FIGURE 6.9.*

1. Slide the half clamp over the footplate hinge.
2. Loosely tighten the two flat screws that secure the footplate to the half clamp.
3. Adjust the footplates to the necessary angle and depth for the user. Refer to Installing/Adjusting Adjustable Angle Flip-Up Footplates on page 69.

### Adjusting Adjustable Angle Flip-up Footplates

#### Depth

*NOTE: For this procedure, refer to FIGURE 6.9.*

1. Remove the two flat screws, washers and locknuts that secure articulating footplate to the half clamp.

*NOTE: Observe the angle of the articulating footplate for reinstallation.*

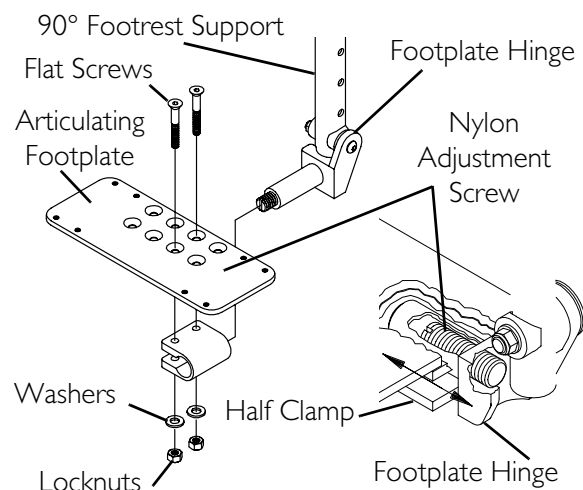
2. Move articulating footplate to one of four mounting positions.

*NOTE: If desired depth is still not obtained, rotate the half clamp on the footplate hinge 180°.*

3. Retighten the two flat screws, washers and locknuts.

*NOTE: The settings for positioning the articulating footplates on the half-clamps may vary for each footplate.*

4. Refer to Angle on page 70 or Perpendicular and/or Inversion/Eversion Adjustment on page 70.

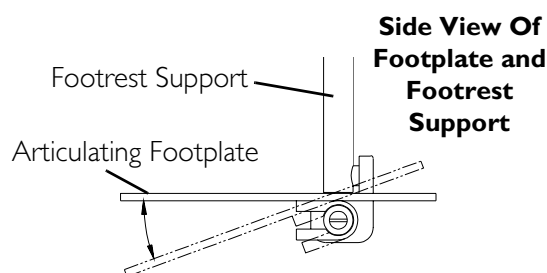


**FIGURE 6.9** Adjusting Adjustable Angle Flip-up Footplates - Depth

## Angle

*NOTE: For this procedure, refer to FIGURE 6.10.*

1. Loosen, but DO NOT remove the two flat screws, washer and locknuts that secure the footplate to the footrest hinge.
2. Position the articulating footplate to the necessary angle to accommodate the user.
3. Retighten the two flat screws, washers and locknuts.



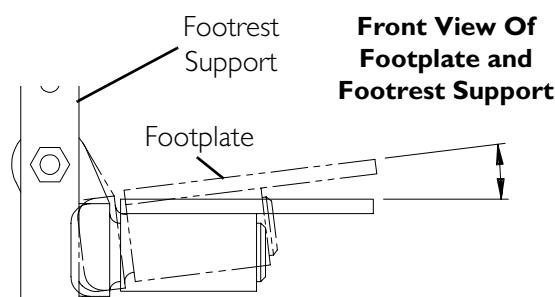
**FIGURE 6.10** Adjusting Adjustable Angle Flip-up Footplates - Angle

## Perpendicular and/or Inversion/Eversion Adjustment

*NOTE: For this procedure, refer to FIGURE 6.11.*

*NOTE: It is not necessary to remove the footplate to perform this adjustment.*

1. Insert a flathead screwdriver through the half clamp on the articulating footplate.
2. Slowly turn nylon adjustment screw in or out until articulating footplate is perpendicular to the footrest assembly or the desired inversion or eversion is obtained.



**FIGURE 6.11** Adjusting Adjustable Angle Flip-up Footplates - Perpendicular and/or Inversion/Eversion Adjustment

## Replacing Composite/Articulating Footplate Heel Loop

*NOTE: For this procedure, refer to FIGURE 6.12 on page 71.*

### Disassembly

#### Composite

1. Remove the mounting screw and spacer that secures the lower half of the footrest to the swingaway footrest assembly.
2. Remove the lower footrest assembly.
3. Remove the mounting screw and locknut that secure the heel loop to the footrest.
4. Slide heel strap over cane of footrest assembly.

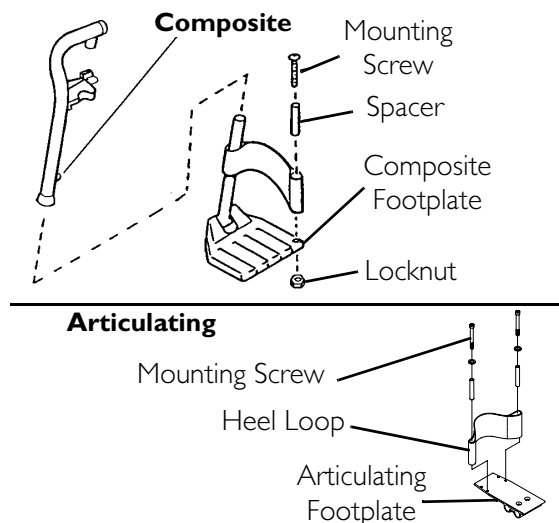
#### Articulating

1. Remove the two mounting screws that secure the heel loop to the articulating footplate.

## Reassembly

1. Replace heel strap/loop.
2. Reverse preceding steps to reassemble.

*NOTE: When securing heel loop to the footrest assembly, tighten mounting screw until the spacer is secure.*



**FIGURE 6.12** Replacing Composite/Articulating Footplate Heel Loop

## Installing/Removing Elevating Legrests

*NOTE: For this procedure, refer to FIGURE 6.13 on page 72.*

### Installing

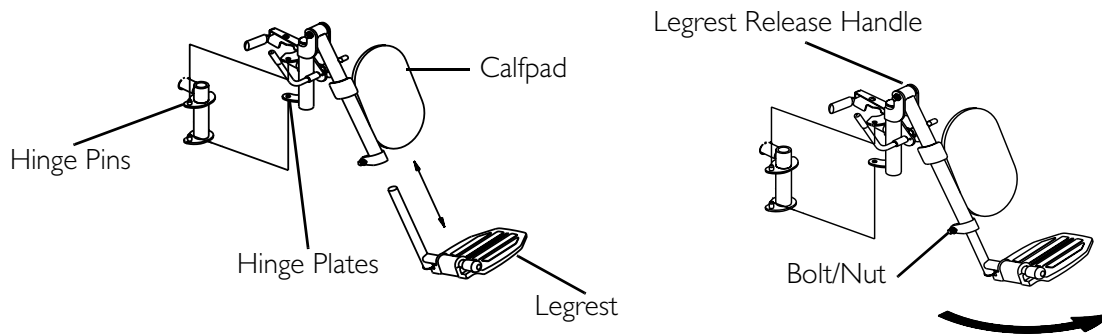
1. Turn legrest to side (open footplate is perpendicular to wheelchair) and position mounting holes in the legrest hinge plates with hinge pins on the wheelchair frame.
2. Install the legrest hinge plates onto the hinge pins on the wheelchair frame.
3. Rotate legrest toward the inside of the wheelchair until it locks in place.

*NOTE: The footplate will be on the inside of the wheelchair when locked in place.*

4. Repeat STEPS 1-3 for the opposite legrest.
5. After seated in wheelchair, adjust footplate to correct height by loosening nut and sliding the lower footrest assembly up or down until desired height is achieved.

### Removing

1. Push the legrest release handle toward the inside of the wheelchair (facing the front of the wheelchair) and swing the legrest to the outside of the wheelchair.
2. Lift up on the legrest and remove from the wheelchair.
3. Repeat STEPS 1- 2 for opposite side of wheelchair.



**FIGURE 6.13** Installing/Removing Elevating Legrests

## Raising/Lowering Elevating Legrests and/or Adjusting Calfpads

*NOTE: For this procedure, refer to FIGURE 6.14 on page 73.*

### Raising/Lowering Elevating Legrests

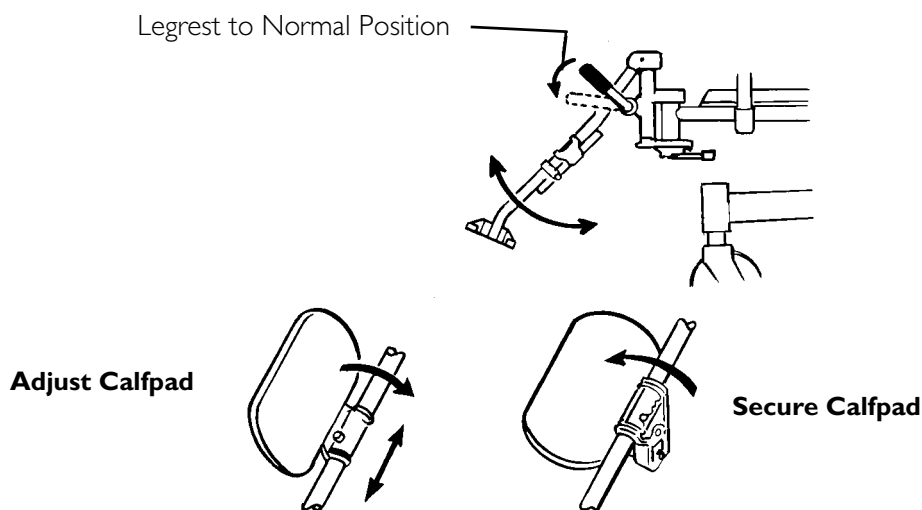
1. Perform one of the following:
  - Raising - Pull back on the release lever until the leg is at the desired height.
  - Lowering - Support leg with one hand and push release lever downward with other hand.

### Adjusting Calfpads

1. Turn the calfpad towards the outside of the wheelchair.
2. Slide the calfpad up or down until the desired position is obtained.

*NOTE: If one of the top two calfpad adjustment positions is being used, the legrest will need to be raised to avoid interference with the front stabilizers while going over obstacles or going up and down ramps. Refer to Raising/Lowering Elevating Legrests and/or Adjusting Calfpads on page 72.*

3. Turn the calfpad towards the inside of the wheelchair.



**FIGURE 6.14** Raising/Lowering Elevating Legrests and/or Adjusting Calfpads

## Installing/Removing/Adjusting the Power Elevating Legrests

### **⚠ WARNING**

To prevent personal injury, always verify proper positioning of legs and feet prior to use. Individual user weight may impact the rate of travel for each legrest assembly. If simultaneous operation is desired, select a speed which allows for the most uniform travel.

**DO NOT** insert fingers between legrest components, otherwise personal injury may occur.

### **CAUTION**

**NEVER** allow items to become trapped between the legrest assemblies, otherwise damage to the power legrests may occur.

**Ensure** that all parts of both power legrests are clear of any obstructions before raising and lowering, otherwise damage to the power legrests may occur.

*NOTE: These procedures apply to wheelchairs with 2G Tarsys seating systems only.*

*NOTE: Power legrests are linked to the recline function of the powered seating system. Operating the recline function automatically operates power legs. Power legrests can also be operated independently of the recline function.*

## Installing the Power Elevating Legrests

*NOTE: For this procedure, refer to FIGURE 6.15.*

1. Turn power legrest to side (open footplate is perpendicular to wheelchair). Refer to Detail "A" of FIGURE 6.15.
2. Insert the mounting pin of power legrest into the mounting hole of the seat frame (Detail "A" of FIGURE 6.15).

*NOTE: Make sure the legrest sits flush on the seat frame.*

3. Rotate the power legs toward the INSIDE of the wheelchair until it locks in place.

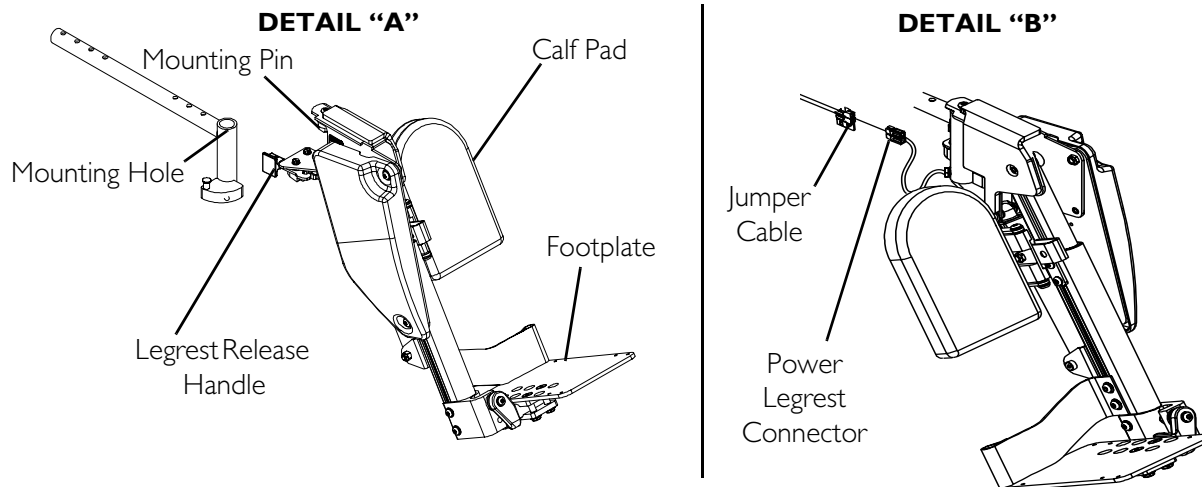
*NOTE: The footplate will be on the INSIDE of the wheelchair when locked in place.*

4. Repeat STEPS 1-3 for the opposite legrest.
5. Connect power legrest connector to jumper cable (Detail "B" of FIGURE 6.15).

## Removing the Power Elevating Legrests

*NOTE: For this procedure, refer to FIGURE 6.15.*

1. Disconnect power legrest connector from jumper cable.
2. Push legrest release handle and swing legrest to the outside of the wheelchair.
3. Lift up on powered legrest and remove from wheelchair.
4. Repeat STEPS 1-3 for opposite power legrest.



**FIGURE 6.15** Installing/Removing/Adjusting the Power Elevating Legrests

## Adjusting the Power Elevating Legrests

The speed of the power legrests must be adjusted to the following specifications, otherwise the legrests will not work properly. For assistance in speed adjustment, contact an Invacare Dealer or qualified technician.

CONTROLLER	LEG UP SPEED	LEG DOWN SPEED
TRCM version 2.2 or earlier	70% or higher	50% or higher
TAC version 1.1 or earlier		
TRCM version 2.3 or higher	40% or higher	35% or higher
TAC version 1.11 or higher		

## Using Mechanical Elevating/Genius Legrests

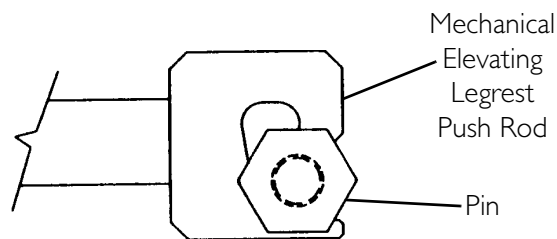
### CAUTION

**DO NOT** operate the recline function of the seating system if one or both of the mechanical elevating legrest push rods is bent. Damage to the seating system can occur.

*NOTE: For this procedure, refer to FIGURE 6.16.*

*NOTE: These procedures apply to wheelchairs with 2G Tarsys seating systems only.*

Mechanical elevating legrests are linked to the recline function of the seating system. Operating the recline function automatically operates elevating legrests.



**FIGURE 6.16** Using Mechanical Elevating/Genius Legrests

## Installing/Removing Mechanical Elevating/Genius Legrests

*NOTE: For this procedure, refer to FIGURE 6.17 on page 76.*

*NOTE: These procedures apply to wheelchairs with 2G Tarsys seating systems only.*

### Installing

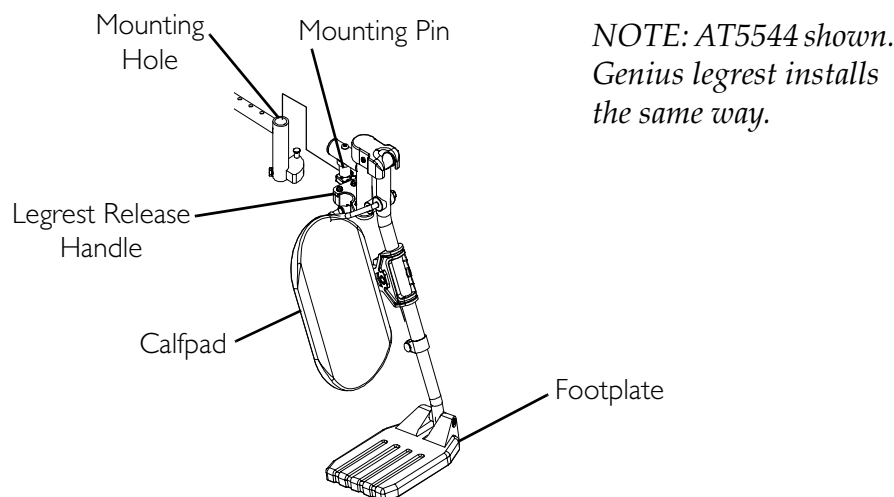
1. Turn elevating legrest to side (open footplate is perpendicular to wheelchair) and position the mounting pin on the legrest mounting holes on the seat frame.
2. Insert the mounting pin into the mounting hole.

*NOTE: Make sure the legrest sits flush on the seat frame.*

3. Rotate the elevating legrest toward the inside of the wheelchair until it locks in place.

*NOTE: The footplate will be on the inside of the wheelchair when locked in place.*

4. Lift the elevating legrest up and position the mechanical elevating legrest push rod around the pin on the legrest as shown in FIGURE 6.17.
5. Press down on mechanical elevating legrest push rod until there is an audible “click”.
6. Repeat STEPS 1-5 for the opposite elevating legrest.
7. If necessary, adjust elevating legrests. Refer to one of the following:
  - Adjusting Mechanical Elevating Legrests on page 76.
  - Adjusting Genius Legrests on page 78.



**FIGURE 6.17** Installing/Removing Mechanical Elevating/Genius Legrests

## Removing

1. Lift up on the mechanical elevating legrest push rod and remove from the pin on the legrest as shown in FIGURE 6.17.
2. Push elevating legrest release handle toward the opposite side of the wheelchair and swing legrest to the outside of the wheelchair.
3. Lift up on elevating legrest and remove from wheelchair.
4. Repeat STEPS 1-3 for opposite side of wheelchair.

## Adjusting Mechanical Elevating Legrests

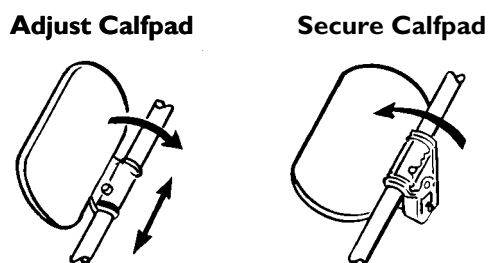
*NOTE: These procedures apply to wheelchairs with 2G Tarsys seating systems only.*

### Calfpads

*NOTE: For this procedure, refer to FIGURE 6.18 on page 77.*

1. Turn the calfpad toward the outside of the wheelchair.
2. Slide calfpad up or down until desired position is obtained.
3. Turn the calfpad toward the inside of the wheelchair.





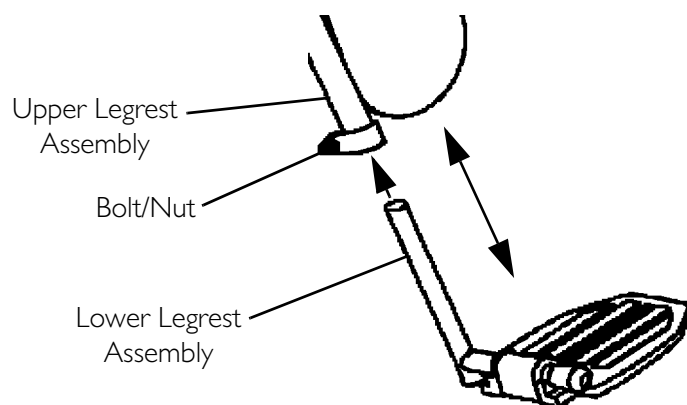
**FIGURE 6.18** Adjusting Mechanical Elevating Legrests - Calfpads

## Footplate Height

*NOTE: For this procedure, refer to FIGURE 6.19.*

*NOTE: The following procedure should be performed with the user in the wheelchair.*

1. Loosen, but DO NOT remove, the bolt and locknut that secure the lower legrest assembly to the upper legrest assembly.
2. Move the lower legrest assembly to the desired position for the user.
3. While holding the lower legrest in position, tighten the bolt and locknut securely.
4. Repeat STEPS 1-4 for opposite legrest if necessary.



**FIGURE 6.19** Adjusting Mechanical Elevating Legrests - Footplate Height

## Speed/Height

*NOTE: Mechanical Elevating Legrest speed and height cannot be adjusted independently of the recline function of the wheelchair. If the mechanical elevating legrests are not operating as desired, have the wheelchair serviced by an Invacare dealer or technician.*

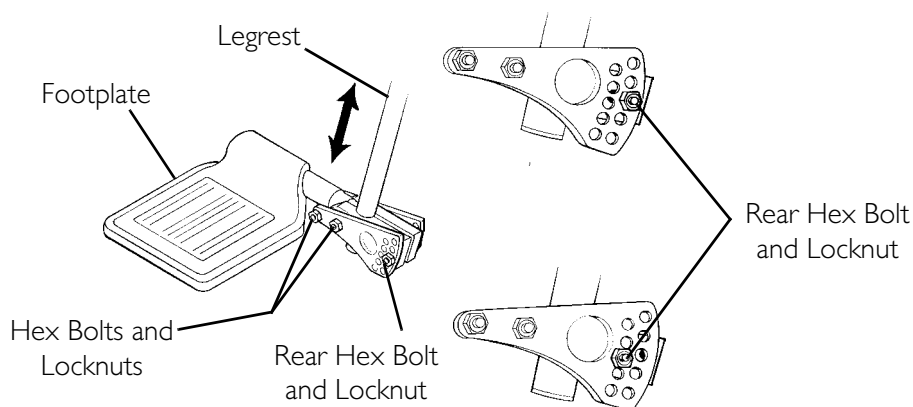
## Adjusting Genius Legrests

*NOTE: These procedures apply to wheelchairs with 2G Tarsys seating systems only.*

### Footplate Height

*NOTE: For this procedure, refer to FIGURE 6.20.*

1. Note the angle of the footplate in relation to the legrest as shown in FIGURE 6.20.
2. Loosen, but DO NOT remove, the three hex bolts and locknuts that secure the footplate to the legrest.
3. Adjust the footplate to the desired height.
4. Line up the footplate to the angle noted in STEP 1.
5. While holding the footplate, tighten the three hex bolts and locknuts securely.



**FIGURE 6.20** Adjusting Genius Legrests - Footplate Height/Footplate Angle

### Footplate Angle

*NOTE: For this procedure, refer to FIGURE 6.20 on page 78.*

1. Note the angle of the footplate in relation to the legrest as shown in FIGURE 6.20.
2. Remove the rear hex bolt and locknut that secure the footplate to the legrest.
3. Move the footplate to the desired angle.
4. Install the hex bolt through the mounting holes that correspond to the desired footplate angle.
5. Install the locknut onto the hex bolt.
6. Line up the footplate to the angle noted in STEP 1.
7. While holding the footplate, tighten the hex bolt and locknut securely.

## Calfpad Height

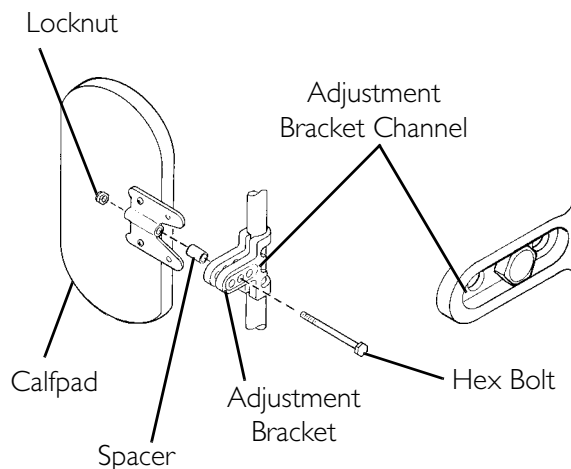
*NOTE: For this procedure, refer to FIGURE 6.21.*

1. Turn the calfpad towards the outside of the wheelchair.
2. Slide calfpad up or down until desired position is obtained.
3. Turn the calfpad towards the inside of the wheelchair.

## Calfpad Depth

*NOTE: For this procedure, refer to FIGURE 6.21.*

1. Remove the hex bolt and locknut that secure the calfpad and spacer to the adjustment bracket.
2. Move the legrest to one of three positions.
3. Reinstall the hex bolt through the spacer and calfpad.



**FIGURE 6.21** Adjusting Genius Legrests - Calfpad Height/Calfpad Depth

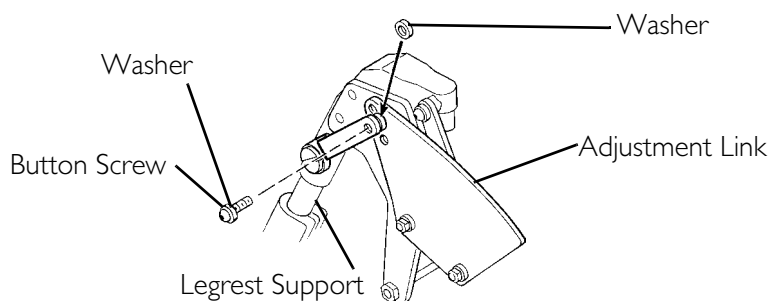
*NOTE: Make sure hex bolt sits flush adjustment bracket channel.*

4. Reinstall locknut onto the hex bolt and tighten securely.

## Legrest Height

*NOTE: For this procedure, refer to FIGURE 6.22.*

1. Remove the button screw that secures the adjustment link and two washers to the legrest support.
2. Move adjustment link to one of three positions.
3. Line up the two washers and adjustment link with the mounting hole in the legrest support.
4. Install the button screw and tighten securely.



**FIGURE 6.22** Adjusting Genius Legrests - Legrest Height

## SECTION 7—ARMS

---

### **⚠ WARNING**

**After ANY adjustments, repair or service and BEFORE use, make sure that all attaching hardware is tightened securely - otherwise injury or damage may result.**

---

## Installing/Removing Flip Back Armrests

---

### **⚠ WARNING**

**Make sure the flip back armrest release and height adjustment levers are in the locked position before using the wheelchair.**

---

*NOTE: For this procedure, refer to FIGURE 7.1 on page 81.*

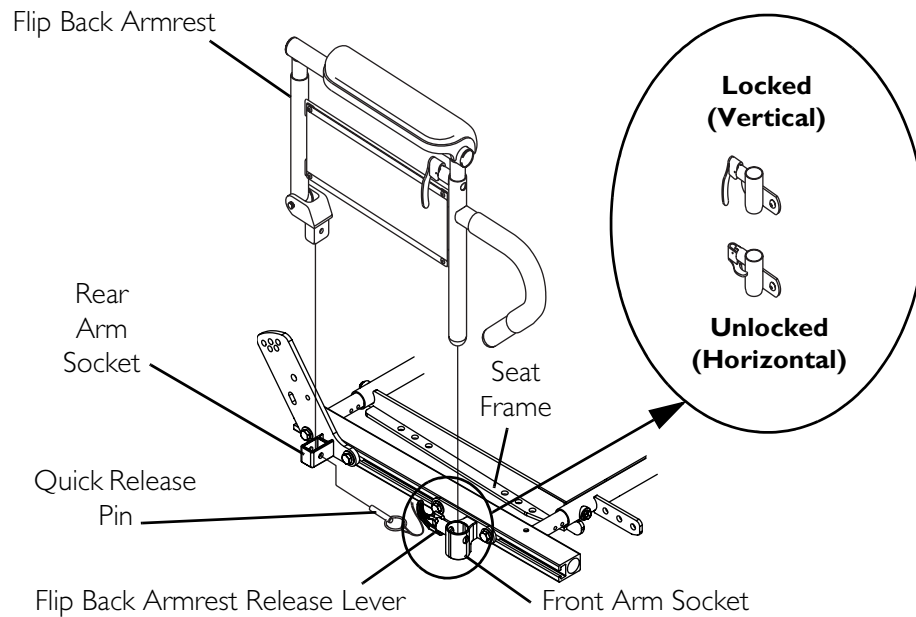
*NOTE: Flip back armrest release lever must be in the unlocked (horizontal) position when placing the armrest into the arm sockets.*

### **Installing**

1. Visually inspect to ensure flip back armrest release lever is in the unlocked (horizontal) position.
2. Slide the flip back armrest into the arm sockets on the seat frame.
3. Install the quick release pin through the rear arm socket and flip back armrest.
4. Lock the flip back armrest by pressing the flip back armrest release lever into the locked (vertical) position.
5. Repeat STEPS 1-4 for the opposite flip back armrest.

### **Removing**

1. Unlock the flip back armrest by positioning the flip back armrest release lever into the unlocked (horizontal) position.
2. Remove the quick release pin that secures the flip back armrest to the rear arm socket.
3. Pull up on the flip back armrest and remove the armrest from the arm sockets.
4. Repeat STEPS 1-3 for the opposite flip back armrest, if necessary.



**FIGURE 7.1** Installing/Removing Flip Back Armrests

## Adjusting Flip Back Armrests

### **⚠ WARNING**

**Make sure the flip back armrest release and height adjustment levers are in the locked position before using the wheelchair.**

*NOTE: For this procedure, refer to FIGURE 7.2 on page 82.*

### **Positioning Flip Back Armrests for User Transfer**

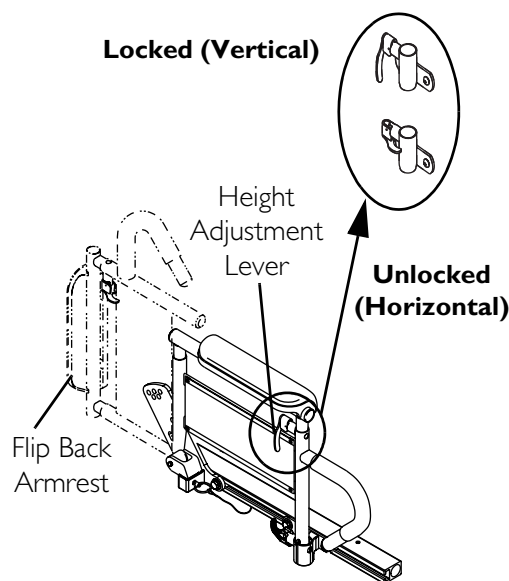
1. Unlock the flip back armrest by pulling the armrest release lever into the up (horizontal) position.
2. Pull up on the flip back armrest and remove the armrest from the front arm socket.
3. Continue to pull up on the flip back armrest until the armrest is out of the way.
4. Repeat STEPS 1-3 for opposite flip back armrest, if necessary.

### **Positioning Flip Back Armrests for Use**

1. Make sure the flip back armrest release lever is in the up (horizontal) position.
2. Install the flip back armrest into the front arm socket.
3. Lock flip back armrest by pressing flip back armrest release lever into the down (vertical) position.
4. Lift up on flip back armrest to make sure the armrest is locked in place.
5. Repeat STEPS 1-4 for opposite flip back armrest, if necessary.

## Adjusting

1. Unlock top of flip back armrest by pulling height adjustment lever into the up (horizontal) position.
2. Adjust top of the flip back armrest to the desired height.
3. Lock top of flip back armrest by pushing height adjustment lever into the down (vertical) position.



**FIGURE 7.2** Adjusting Flip Back Armrests

## Adjusting Captain's Van Seat Armrests

### Angle

*NOTE: For this procedure, refer to FIGURE 7.3.*

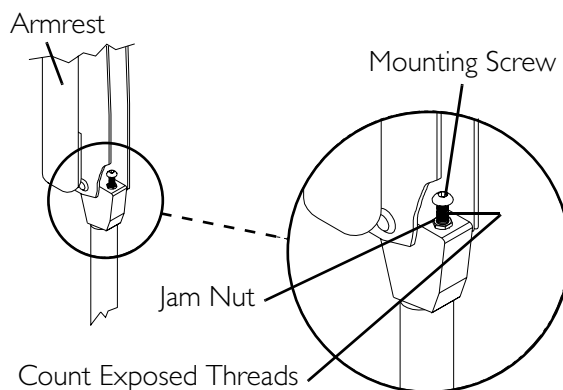
1. Lift-up the armrest and loosen the jam nut.

*NOTE: Adjust the mounting screw up or down to the desired arm angle position.*

*NOTE: Tighten the jam nut.*

*NOTE: Repeat STEPS 1-3 for opposite armrest.*

*NOTE: To determine the same angle for the opposite armrest, count the exposed threads after the jam nut has been tightened.*

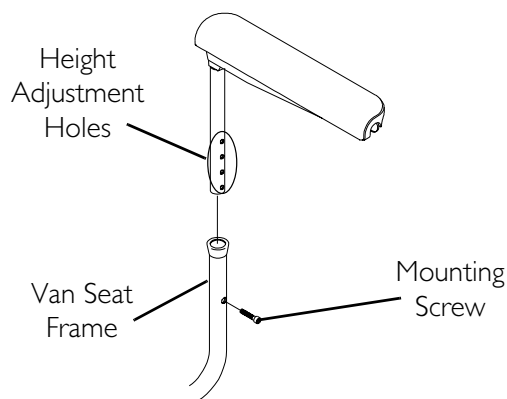


**FIGURE 7.3** Adjusting Captain's Van Seat Armrests - Angle

## Height

*NOTE: For this procedure, refer to FIGURE 7.4.*

1. Remove the mounting screw that secures the armrest to the van seat frame.
2. Adjust the armrest to one of four positions.
3. Reinstall the mounting screw that secures the armrest to the van seat frame and tighten securely.



**FIGURE 7.4** Adjusting Captain's Van Seat Armrests - Height

## Removing/Installing Reclining Armrests

*NOTE: For this procedure, refer to FIGURE 7.5.*

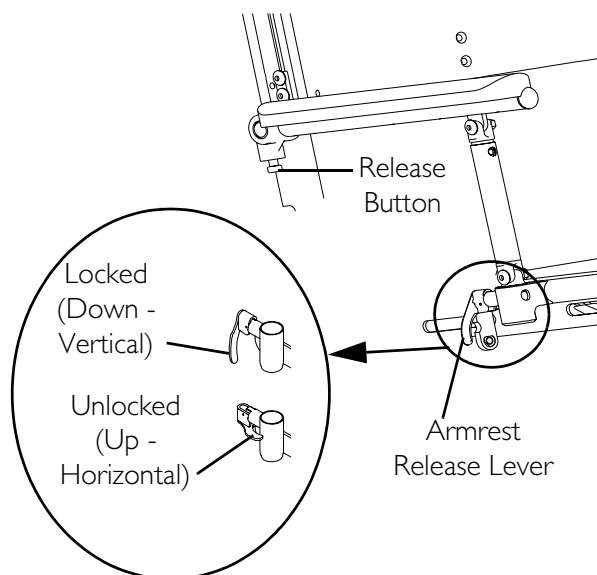
*NOTE: This procedure applies to 2G Tarsys seating systems only.*

### Removing Armrests

1. Lift the armrest release lever at the front of the wheelchair to the unlocked (horizontal) position.
2. Lift up on the armrest and remove from the front arm socket.
3. Press the release button at the rear of the armrest in.
4. While holding the release button in, remove the armrest from the seat frame.

### Installing Armrests

1. Position the armrest on the seat frame as shown in FIGURE 7.5.
2. Press the release button at the rear of the armrest in.
3. While holding the release button in, slide the armrest onto the seat frame.
4. Make sure the armrest release lever is in the unlocked (horizontal) position.
5. Install the armrest into the front socket.
6. Push the armrest release lever down into the locked (vertical) position.



**FIGURE 7.5** Removing/Installing Reclining Armrests

## Adjusting Reclining Armrest Height

*NOTE: For this procedure, refer to FIGURE 7.6.*

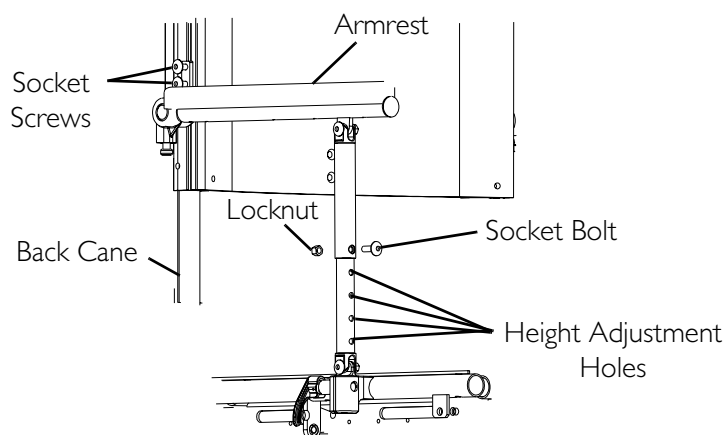
*NOTE: This procedure applies to 2G Tarsys seating systems only.*

1. Make sure the seating system is in the full upright position. **Refer to Operating Powered Seating Systems on page 50.**
2. Remove the socket bolt and locknut that secure the front of the upper armrest to the lower armrest.
3. Loosen, but DO NOT remove, the two socket screws that secure the rear of the armrest of the back cane.
4. Adjust the armrest to the desired height for the user.

*NOTE: The armrests can be at different heights to accommodate the user.*

*NOTE: The armrest adjusts from 11 to 16 inches in 1-inch increments.*

5. Reinstall the socket bolt through the mounting hole determined in STEP 4.
6. Reinstall the locknut and tighten securely.
7. While holding the armrest level, tighten the two socket screws that secure the rear of the armrest to the back cane.
8. Repeat STEPS 2-7 for the opposite side if necessary.



**FIGURE 7.6** Adjusting Reclining Armrest Height



## SECTION 8—POSITIONING STRAP

### **⚠ WARNING**

After **ANY** adjustments, repair or service and **BEFORE** use, make sure that all attaching hardware is tightened securely - otherwise injury or damage may result.

The seat positioning strap is a positioning belt only. It is not designed for use as a safety device withstanding high stress loads such as auto or aircraft safety belts. If signs of wear appear, belt **MUST** be replaced immediately.

## Replacing Seat Positioning Strap

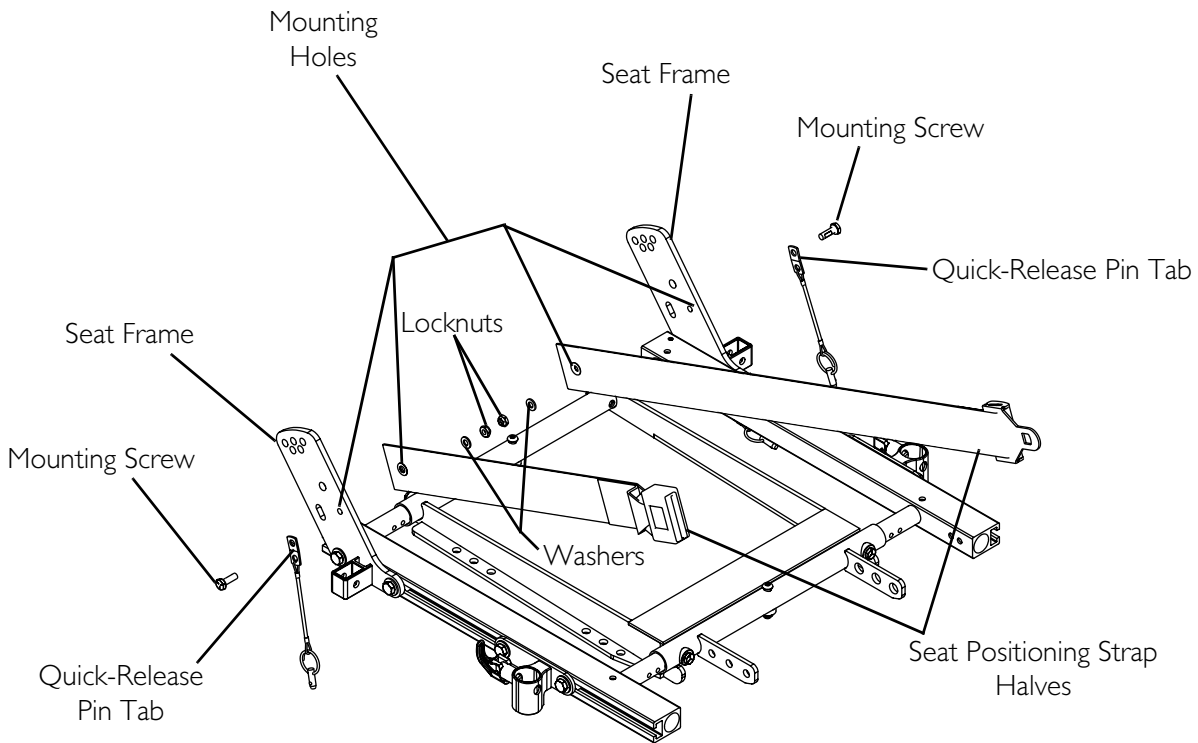
### **Wheelchairs with TRRO Option**

To replace the seat positioning strap, refer to Wheelchair-Anchored Belts on page 126.

### **Wheelchairs without 2G Tarsys Seating Systems or TRRO Option**

*NOTE: For this procedure, refer to FIGURE 8.1 on page 86.*

1. Remove the seat cushion from the seat pan.
2. Move the flip back armrests out of the way. Refer to Adjusting Flip Back Armrests on page 81.
3. Remove the two mounting screws, locknuts, washers and quick-release pin tabs that secure the seat positioning straps to the seat frame.
4. Remove the two halves of the seat positioning strap from the rear seat frame.
5. Reposition the two new seat positioning strap inside of the seat frame as shown.
6. Reinstall the two mounting screws and quick-release pin tabs that secure the seat positioning straps to the seat frame and torque to 75 in-lbs.
7. Reinstall the seat cushion onto the seat pan.

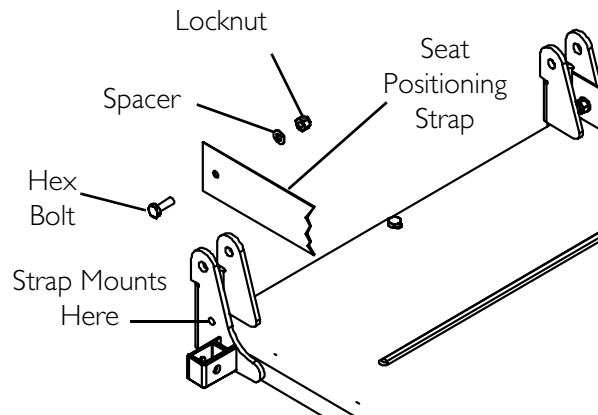


**FIGURE 8.1** Replacing Seat Positioning Strap - Wheelchairs without 2G Tarsys Seating Systems or TRRO Option

## Wheelchairs with 2G Tarsys Seating Systems

*NOTE: For this procedure, refer to FIGURE 8.2.*

1. Remove the two hex bolts, washers and locknuts that secure the two halves of the seat positioning strap to the seat frame.
2. Remove the existing seat positioning strap from the seat frame.
3. Position the new seat positioning strap on the seat frame as shown.
4. Reinstall the hex bolt, washer and locknut as shown. Tighten securely.



**FIGURE 8.2** Replacing Seat Positioning Strap - Wheelchairs with 2G Tarsys Seating Systems

## SECTION 9—VAN SEAT

### **⚠ WARNING**

After **ANY** adjustments, repair or service and **BEFORE** use, make sure that all attaching hardware is tightened securely - otherwise injury or damage may result.

## Adjusting Van Seat Angle

*NOTE: For this procedure, refer to FIGURE 9.1.*

### Low Back Van Seats

1. Lift up on the release handle and move the back to the desired position

### High Back Van Seats

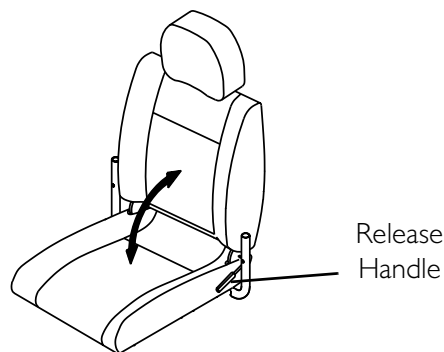
### **⚠ WARNING**

#### **HIGH BACK CAPTAIN'S VAN SEATS ONLY**

**NEVER** operate the wheelchair while in any recline position over 114° relative to the seat frame. If the limit switch does not stop the wheelchair from operating in a recline position greater than 114° relative to the seat frame, **DO NOT** operate the wheelchair. Have the limit switch adjusted by an authorized Invacare dealer or qualified technician.

**When using high back Captain's van seat, the motor/gearbox or motor MUST use the MOST rearward mounting holes on the suspension arm assembly.**

1. Lift up on the release handle and move the back to the desired position.
2. Check the angle of the back relative to the seat frame.
3. If necessary, have the limit switch adjusted by an authorized dealer or qualified technician.



**FIGURE 9.1** Adjusting Van Seat Angle

# SECTION 10—BATTERIES

## Warnings for Handling and Replacing Batteries

---

### **WARNING**

After **ANY** adjustments, repair or service and **BEFORE** use, make sure all attaching hardware is tightened securely - otherwise injury or damage may occur.

Make sure power to the wheelchair is **OFF** before performing these procedures.

The use of rubber gloves is recommended when working with batteries.

Invacare strongly recommends that battery installation and battery replacement **ALWAYS** be done by a qualified technician.

22NF batteries weigh 37 pounds each. Use proper lifting techniques (lift with your legs) to avoid injury.

GP24 batteries weigh 51 pounds each. Use proper lifting techniques (lift with your legs) to avoid injury.

Use 22NF or GP24 batteries only. Failure to use the correct battery size and/or voltage may cause damage to your wheelchair and give you unsatisfactory performance.

**ALWAYS** use a battery lifting strap when lifting a battery. It is the most convenient method and assures that the battery acid will not spill. It also helps to prolong the life of the battery.

**DO NOT** tip the batteries. Keep the batteries in an upright position.

**NEVER** allow any of your tools and/or battery cable(s) to contact **BOTH** battery post(s) at the same time. An electrical short may occur and serious personal injury or damage may occur.

When tightening the clamps, always use a box wrench. Pliers will “round off” the nuts. **NEVER** wiggle the battery terminal(s)/post(s) when tightening. The battery may become damaged.

The **POSITIVE (+) RED** battery cable must connect to the **POSITIVE (+)** battery terminal(s), otherwise serious damage will occur to the electrical system.

Install protective caps on **POSITIVE (+)** and **NEGATIVE (-)** battery terminals.

**DO NOT** remove fuse or mounting hardware from **POSITIVE (+) RED** battery cable mounting screw.

---

*NOTE: If there is battery acid in the bottom of the battery tray or on the sides of the battery(ies), apply baking soda to these areas to neutralize the battery acid. Before reinstalling the existing or new battery(ies), clean the baking soda from the battery tray or battery(ies) being sure to avoid contact with skin and eyes. Determine source of contamination. NEVER install/reinstall a battery with a cracked or otherwise damaged case.*